

The 138th HENPIC seminar by Prof. Jianhua Gao 高建华 (Shandong University, Weihai), Apr. 22, 2021, Thursday, 10:30 (UTC+8)

Talk title: Second order non-dissipative currents in a chiral system

Speaker: Prof. Jianhua Gao, Shandong University (Weihai)

Abstract:

In this talk, I will mainly present the second order non-dissipative transport coefficients derived from the Wigner equation for massless spin-1/2 charged fermions in global equilibrium. The Wigner equation can be solved order by order in the power expansion of the vorticity and electromagnetic field. The Wigner function is derived up to the second order from which the non-dissipative charge currents and the stress tensor can be obtained. At second order, the vector and axial Hall currents can be induced along the direction orthogonal to the vorticity and electromagnetic field and the charge and energy densities and the pressure have contributions from the vorticity and electromagnetic field as well. We also demonstrate that the solution in global equilibrium is fully constrained at the first order while some terms associated with vorticity at second order can only be determined up to some unknown functions. Besides, I will also discuss the trace anomaly of the energy-momentum tensor.

Self-introduction:

Jianhua Gao is currently a professor at Shandong University (Weihai). He obtained the PhD degree in Shandong University (Jinan) in 2008, then worked as a postdoc in USTC for two years. He joined Shandong University (Weihai) as an associate professor in 2011. His current research interests are quantum kinetic theory and chiral & spin effects in relativistic heavy-ion collisions.

Presenter: Prof. GAO, Jianhua